

REMARKS

Claims 1, 4, 13-15, and 46 have been amended to more clearly define the subject matter of the claimed invention. No new matter is presented by these amendments.

In the Office Action dated July 11, 2008, claims 1-26, 28-44, and 46-57 were rejected under 35 USC § 103(a), as being unpatentable over *Kang* (US 6,009,210) in view of *Kanade et al.* (US 6,151,009). In view of the present amendments to the claims and the arguments set forth below, the Applicants respectfully traverse the rejection.

Claim 1 has been amended to define the view of the scene as comprising “a view-frustum initially defined by a gaze projection of a position of the head through outer edges of the virtual window when the position of the head is substantially normal to about a center point of the virtual window.” Additionally, the view-frustum is adjusted “in accordance with the change in position of the head of the user” such that “the adjusted view-frustum [is] defined by an updated gaze projection of the changed position of the head through the outer edges of the virtual window.”

The *Kang* reference teaches a hands-free navigation system for tracking a head and responsively adjusting the display of a virtual reality environment. *Kang* does teach the tracking of various pose parameters of a user’s head/face, including translational and rotational movements. However, in regard to “the problem of using [the pose parameters] to control the viewing of the virtual reality environment” (Col. 8, lines 26-27), *Kang* discloses only two methods. The first method taught is “to directly use the pose parameters to determine the absolute position and orientation of the viewpoint” (Col. 8, lines 27-29). In other words, movement of a user’s head in a given direction produces movement of the view of the virtual reality environment in the same direction. The second method taught applies the same directional system, but incorporates incremental control to “indicate continuous movement within the virtual reality environment” (Col. 8, lines 32-40).

In contrast to *Kang*, Applicants' claim 1 is directed towards a view of a scene comprising a view-frustum defined with reference to a gaze projection of a position of the head of the user through the outer edges of a virtual window. The volumetric virtual space beyond the virtual window which is delimited by the gaze projection through the outer edges defines the view-frustum. And as the user's head moves, the view-frustum is adjusted accordingly, such that the gaze projection through the virtual window is updated in light of the changed position of the user's head to determine the new view-frustum. Thus, in contrast to the direct use of pose parameters to determine viewpoint disclosed by *Kang*, Applicants' claim 1 utilizes an indirect method wherein the view of the scene is defined with reference to a virtual window. Hence, a movement of a user's head in a lateral direction will have the perceptual effect of shifting the view of the scene in the *opposite* direction. *Kang* does not disclose a view-frustum defined with reference to a virtual window, nor the adjustment of such a view-frustum in the manner claimed.

In paragraph 13 of the Office Action, the Examiner appears to take official notice that depth cameras, as are known in the art, disclose the gaze projection and view-frustum features as claimed by the Applicants. To the extent official notice is taken, the official notice is traversed. Applicants are unable to discern how a depth camera discloses a view-frustum defined by a gaze projection through outer edges of a virtual window, much less the adjustment of the view-frustum in accordance with a change in position of a user's head as claimed. Applicants submit that the operation of a depth camera, which at most captures images and determines the depth of objects, is simply insufficiently related to Applicants' claimed invention, which defines a method for processing interactive user control for a view of a scene displayed on a virtual window.

The *Kanade* reference teaches a method for merging real and synthetic images in real time. The Examiner cites this reference as teaching the use of a depth capturing camera. However, *Kanade* does not teach the view-frustum defined by a gaze projection through outer edges of a virtual window, or its adjustment in accordance with a change in position of a user's head as claimed. Therefore, *Kanade* does not cure the deficiencies of the references discussed above.

In sum, none of the cited art of record discloses the view-frustum and adjustment features as claimed. Therefore, for at least the reasons discussed above, it is believed that claim 1 is patentable over the teachings of *Kang* and *Kanade*.

Independent claims 4 and 13 have been amended in a similar manner as claim 1. Thus, for at least the same reasons as discussed above regarding claim 1, it is believed that claims 4 and 13 are patentable over the cited art of record.

Claims 5-12 depend from independent claims 1 and 4. Because a dependent claim incorporates each feature of the independent claim from which it depends, claims 5-12 are believed to be allowable for at least the same reasons as discussed above concerning independent claims 1 and 4.

Independent claim 14 has been amended to define the translation of the view-frustum in a direction opposite to the change in position of the head of the user. As discussed previously, the cited art of record does not disclose a relationship between a change in position of the head of the user and the adjustment of the view-frustum in the opposite direction. Therefore, it is believed that claim 14 is patentable over the cited art of record. Claims 15-19 and 21 depend from claim 14, and are believed to be patentable over the prior art by virtue of their dependence from claim 14.

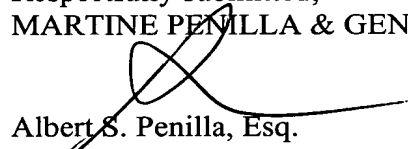
Independent claim 46 has been amended to define the location change of the control object effecting an alignment of the view-frustum in the opposite direction relative to the display screen. Similar reasoning as discussed previously may be applied, as the cited art of record does not disclose a relationship between a location change of a control object and alignment of a view-frustum in the opposite direction. Therefore, it is believed that claim 46 is patentable over the cited art of record. Claims 47-50 depend from claim 46, and are believed to be patentable over the prior art by virtue of their dependence from claim 46.

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In view of the foregoing, Applicants respectfully submit that all of the pending claims are in condition for allowance. A notice of allowance is respectfully requested.

In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 774-6903. If any fees are due in connection with the filing of this paper, then the Commissioner is authorized to charge such fees to Deposit Account No. 50-0805 (Order No. SONYP029).

Respectfully submitted,
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